TIGGER Transit Investments for Greenhouse Gas and Energy Reduction

U.S. Department of Transportation
Federal Transit Administration

TIGGER Program Overview

The Transit Investments for Greenhouse Gas and Energy Reduction (TIGGER) Program provides capital grants to public transit agencies for the purpose of reducing energy use or greenhouse gas emissions of public transportation systems. TIGGER was initiated by the U.S. Department of Transportation's Federal Transit Administration (FTA) in 2009. Under the American Recovery and Reinvestment Act (ARRA), the TIGGER Program competitively awarded an initial $100 million to projects that would help meet the FTA's sustainability goals.

Two types of capital projects were eligible under the program:

- Investments that assist the agency in reducing energy consumption
- Investments that reduce greenhouse gas emissions.

Projects could be submitted under either or both categories. More than 500 proposals were submitted from transit agencies all over the country. Projects selection was based on six specific evaluation criteria:

- ***Total projected energy or greenhouse gas emission savings results for the project*** – Will the project actually reduce total energy consumption or greenhouse gas emissions for the transit agency?
- ***Project innovation*** – Does the project represent a unique, innovative, or significant new approach to reducing energy consumption or greenhouse gas emissions?
- ***National applicability*** – Can the project be replicated by other transit agencies across the United States?

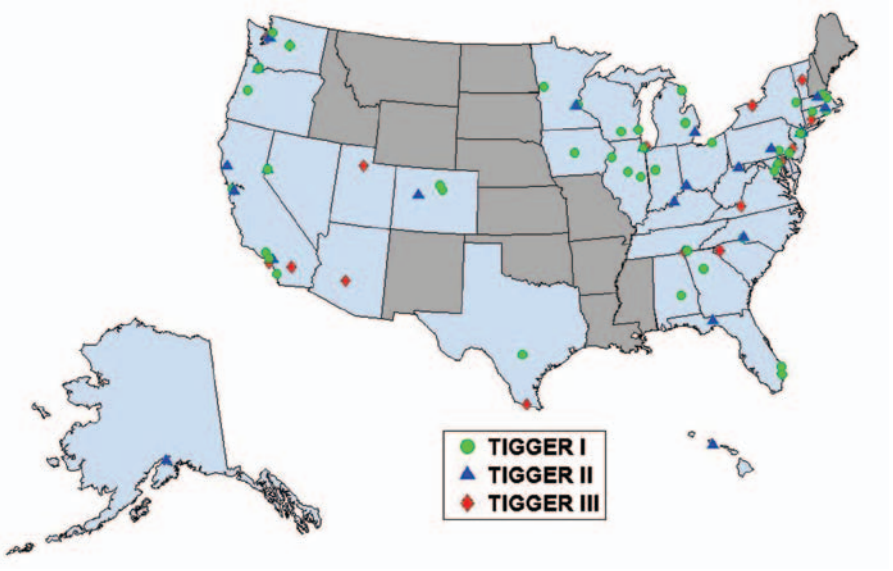
Courtesy of LRTA

TIGGER projects include a variety of solar installations that reduce transit agency energy use.

- ***Project readiness*** – Can the agency implement the project quickly?
- ***Project management*** – Does the agency have the resources and technical ability to carry out the project and collect and demonstrate results?
- ***Return on investment*** – How much energy savings or emissions reductions will be achieved relative to the project cost?

A total of 43 projects were awarded covering a wide variety of technologies, including solar installations, building efficiency improvements, wind technology, wayside energy storage for rail, and purchase of more efficient buses.

In 2010, Congress appropriated an additional $75 million for the TIGGER Program through the Transportation, Housing, and Urban Development, and Related Agencies Appropriations Act, 2010. Applicants submitted proposals to meet the same program goals, but there was an added emphasis on innovation and national applicability. FTA awarded grants for 27 projects in the second round. In 2011, through the Department of Defense and Full-Year Continuing Appropriations Act, 2011, Congress appropriated another $49.9 million for projects that met the original program goals and that specifically emphasized transit innovation. FTA awarded funds to 18 new projects in this round, bringing the total number of TIGGER projects to 88. These projects support FTA's commitment to the environment while promoting cost-efficient alternatives.



The awarded TIGGER projects are geographically diverse, covering 35 states and 68 different transit agencies.

Summary of Projects by Technology Employed

Technology Type	Number of Projects
Bus efficiency projects	40
Hybrid buses	19
Efficiency retrofit	5
Zero-emission buses	16
Rail projects	10
Wayside energy storage system	3
Locomotive upgrades	3
On-board energy storage	2
Controls	2
Facility efficiency projects	38
Facility upgrades	13
Solar	15
Wind	2
Stationary fuel cell	3
Geothermal	5

Note: several projects employ multiple energy efficient technologies.

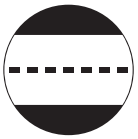
Courtesy of TriMet

TIGGER rail projects include efficient locomotives and technologies to store and reuse braking energy.

Technologies to Reduce Energy Use and Greenhouse Gas Emission

The TIGGER Program projects are implementing a diverse selection of technologies to meet the overall goals. Each transit agency project is using one or more of the following technologies to achieve their goals for reduced energy and emissions.

Facility efficiency. Projects selected for improving building efficiencies at transit facilities include installing energy efficient lighting, implementing improved boiler technologies, and replacing windows or roofs. These projects are designed to provide a more sustainable future for the efficient operation of transit agency facilities.



Bus efficiency. The selected bus efficiency projects include purchasing fuel efficient buses as well as making retrofits to existing buses to improve fuel economy and therefore reduce fuel use. These projects will improve air quality across the participating transit agency's community and increase public visibility for these innovative new technologies.

Solar. The selected solar energy projects include installations of various sizes, from small systems to heat water up to large-scale systems that can power entire facilities. Commercially available photovoltaic (PV) panels are used to produce DC (direct current) power directly from the sun's energy. The output from the panel is connected to an inverter that converts DC power to AC (alternating current) power, allowing the solar system to be connected to a utility via the electric grid. These solar systems can supply a portion of the transit agency's power demand, or in times of low energy demand, the system can put excess power back onto the grid.

Rail. Rail projects selected for TIGGER funding include installing technologies that store and reuse braking energy and making improvements to locomotive efficiency.

Wind. Small-scale wind power projects selected under the TIGGER program include installing wind turbines that will supplement the power usage at transit agency facilities. These projects are designed to reduce the transit agency's overall electrical energy consumption by producing renewable power on-site.

Geothermal. Geothermal projects selected for funding include new, in-ground installations that provide improved heating and cooling at transit agency facilities. These geothermal installations are an advanced, cost-effective alternative to conventional ventilation systems that will also reduce heating and cooling loads at the transit agency.

Fuel cells. The selected fuel cell projects include installing stationary systems to provide power for transit facilities. Fuel cells–which combine hydrogen and air to produce electricity, water and heat–can be used to supply prime power, backup power, or combined heat and power.

Program Assessment

To assess the effectiveness of the TIGGER Program, FTA has enlisted the help of the National Renewable Energy Laboratory (NREL) to provide a third-party assessment. NREL is a U.S. Department of Energy national laboratory that is focused on renewable energy and energy efficiency research and development. With FTA and the TIGGER project partners, NREL is collecting results data on energy savings, GHG emissions reductions, and operational costs of the new technologies. NREL will evaluate, assess, and validate the implementation of the TIGGER Program by cataloguing and documenting the technologies used by each of the projects. At project completion, NREL will analyze the results from each project to estimate the overall impacts of the program and to assess each project's contribution to program goals. This analysis will include metrics such as environmental impacts, reduction of fossil fuel use, emissions savings, economic impacts, viability of technologies adopted, and benefits versus costs.

Courtesy of NREL

Many transit agencies are adding more efficient hybrid buses to their fleets to reduce energy use.

All TIGGER projects will be documented in individual fact sheets and annual program reports. Each project fact sheet as well as the annual reports will be posted on FTA's TIGGER website.

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For More Information

FTA TIGGER: ***www.fta.dot.gov/TIGGER***